UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte MICHAEL JEFFERS, RICHARD A. SHIMKETS, SUDHIRDAS K. PRAYAGA, FERENC L. BOLDOG, NODH, MEIJIA YANG, CATHERINE BURGESS, ELMA FERNANDES, JOHN L. HERRMANN, WILLIAM J. LAROCHELLE, and HENRI LICHENSTEIN

Appeal No. 2005-0759
Application No. 09/609,543

HEARD: May 3, 2005

Before WILLIAM F. SMITH, ADAMS, and GRIMES, Administrative Patent Judges.

ADAMS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 5, 41, 46, 63 and 64, which are all the claims pending in the application.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. An isolated polypeptide comprising an amino acid sequence shown in SEQ ID NO:2

The references relied upon by the examiner are:

Galzie et al. (Galzie), "Fibroblast growth factors and their receptors," Biochem. Cell Biol., Vol. 75, pp. 669-685 (1997)

Jeffers et al. (Jeffers), "A Novel Human Fibroblast Growth Factor Treats Experimental Intestinal Inflammation," Gastroenterology, Vol. 123, pp. 1151-1162 (2002)

GROUNDS OF REJECTION

Claims 1, 5, 41, 46, 63 and 64 stand rejected under 35 U.S.C. § 101 as lacking utility and § 112, first paragraph, for lack of enablement based on the finding of lack of utility.

We reverse.

BACKGROUND

According to appellants (specification, page 1), "[t]he fibroblast growth factor (FGF) group of cytokines includes at least 21 members that regulate diverse cellular functions such as growth, survival, apoptosis, motility and differentiation." The FGF group of cytokines "transduce signals via high affinity interactions with cell surface tyrosine kinase FGF receptors (FGFRs) ... [which] are expressed on most types of cells in tissue culture." Id. According to appellants, the polypeptide of claim 1, has homology to members of the FGF family of proteins. Specification, page 2. More specifically, appellants disclose (specification, page 10), "[t]he present invention provides a novel human FGF ... [which] has been shown to exhibit growth stimulatory and oncogenic properties." According to appellants (Brief, page 6), the claimed "polypeptide is alternatively

referred to throughout the specification by the term 'FGF-CX' or 'FGF-20X'."

However, as the examiner points out (Answer, page 2), "[w]hether the claimed invention has utility in promoting growth of cells as asserted in the instant specification is the issue before the Board." In this regard, the examiner finds (Answer, page 5),

> There is absolutely no evidence of record or any line of reasoning that would support a conclusion that the "FGF-CX" protein of the instant application could be used in a method of diagnosing, treating, preventing, or delaying a tissue proliferation-associated disorder, such as "tumors, restenosis, psoriasis, Dupuytren's contracture, diabetic complications, Kaposi sarcoma, and rheumatoid arthritis" (see page 6, lines 3-7 of the specification), in a method of "treating a pathological state in a mammal" by administering the polypeptide (see page 5, line 6), in a method of "promoting growth of cells in a subject" wherein the cells are "in the vicinity of a wound, cells in the vascular system, cells involved in hematopoiesis, cells involved in erythropoiesis, cells in the lining of the gastrointestinal tract, and cells in hair follicles" (see page 5, line 15-21), in "methods of diagnosing the presence or amounts of these compositions, in screening for and identifying therapeutic agents related to FGF-CX-associated pathologies, and in methods of treatment of various kinds of malignancy" (see sentence spanning pages 17-18), for use in screening assays, detection assays, predictive medicine, and methods of treatment (see sentence spanning pages 67-68), for stimulation of fibroblasts for use in wound healing (see page 76, lines 29-36), for stimulation of hematopoietic cells, immune system cells, and vascular smooth muscle cells, as well as for treating bone fractures and osteoporosis (see page 77, lines 1-3), diagnosis of cerebral tumors (page 77, lines 3-4), and for treatment of cancer (page 77, lines 9-13).

Against this backdrop, we now consider the merits of the issues presented for our review.

DISCUSSION

The examiner rejected all of the claims as lacking patentable utility.[1] The examiner bears the initial burden of showing that a claimed invention lacks patentable utility. See In re Brana, 51 F.3d 1560, 1566, 34 USPQ2d 1436, 1441 (Fed. Cir. 1995) ("Only after the PTO provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility.").

The seminal decision interpreting the utility requirement of § 101 is Brenner v. Manson, 383 U.S. 519, 148 USPQ 689 (1966). At issue in Brenner was a claim to "a chemical process which yields an already known product whose utility—other than as a possible object of scientific inquiry—ha[d] not yet been evidenced." Id. at 529, 148 USPQ at 693. The Patent Office had rejected the claimed process for lack of utility, on the basis that the product produced by the claimed process had not been shown to be useful. See id. at 521-22, 148 USPQ at 690. On appeal, the Court of Customs and Patent Appeals reversed, on the basis that "where a claimed process produces a known product it is not necessary to show utility for the product." Id. at 522, 148 USPQ at 691.

The Brenner Court noted that although § 101 requires that an invention be "useful," that "simple, everyday word can be pregnant with ambiguity when

[1] The examiner rejected the claims under 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph. However the rejection for nonenablement was presented simply as a corollary of the finding of lack of utility. See Answer, page 5. Therefore, although we discuss only the § 101 rejection, our conclusion also applies to the § 112 rejection.

applied to the facts of life." Id. at 529, 148 USPQ at 693. Thus,

> [it] is not remarkable that differences arise as to how the test of usefulness is to be applied to chemical processes. Even if we knew precisely what Congress meant in 1790 when it devised the "new and useful" phraseology and in subsequent re-enactments of the test, we should have difficulty in applying it in the context of contemporary chemistry, where research is as comprehensive as man's grasp and where little or nothing is wholly beyond the pale of "utility"—if that word is given its broadest reach.

Id. at 530, 148 USPQ at 694.[2]

The Court, finding "no specific assistance in the legislative materials underlying § 101," based its analysis on "the general intent of Congress, the purposes of the patent system, and the implications of a decision one way or the other." Id. at 532, 148 USPQ at 695. The Court concluded that "[t]he basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point—where specific benefit exists in currently available form—there is insufficient justification for permitting an applicant to engross what may prove to be a broad field." Id. at 534-35, 148 USPQ at 695.

The Court considered and rejected the applicant's argument that attenuating the requirement of utility "would encourage inventors of new processes to publicize the event for the benefit of the entire scientific community, thus widening the search for uses and increasing the fund of scientific

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[2] The invention at issue in Brenner was a process, but the Court expressly noted that its holding "would apply equally to the patenting of the product produced by the process." Id. at 535, 148 USPQ at 695-96.

knowledge." The Court noted that, while there is value to encouraging disclosure, "a more compelling consideration is that a process patent in the chemical field, which has not been developed and pointed to the degree of specific utility, creates a monopoly of knowledge which should be granted only if clearly commanded by the statute. Until the process claim has been reduced to production of a product shown to be useful, the metes and bounds of that monopoly are not capable of precise delineation. It may engross a vast, unknown, and perhaps unknowable area. Such a patent may confer power to block off whole areas of scientific development." Id. at 534, 148 USPQ at 695.

The Court took pains to note that it did not "mean to disparage the importance of contributions to the fund of scientific information short of the invention of something 'useful,'" and that it was not "blind to the prospect that what now seems without 'use' may tomorrow command the grateful attention of the public." Id. at 535-36, 148 USPQ at 696. Those considerations did not sway the Court, however, because "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion." Id.

Subsequent decisions of the CCPA and the Court of Appeals for the Federal Circuit have added further layers of judicial gloss to the meaning of § 101's utility requirement. The first opinion of the CCPA applying Brenner was In re Kirk, 376 F.2d 936, 153 USPQ 48 (CCPA 1967). The invention claimed in Kirk was a set of steroid derivatives said to have valuable biological properties and to be of value "in the furtherance of steroidal research and in the application of steroidal materials to veterinary or medical practice." Id. at 938, 153 USPQ at

50. The claims had been rejected for lack of utility. In response, the applicants submitted an affidavit which purportedly "show[ed] that one skilled in the art would be able to determine the biological uses of the claimed compounds by routine tests." Id. at 939, 153 USPQ at 51.

The court held that "nebulous expressions [like] 'biological activity' or 'biological properties'" did not adequately convey how to use the claimed compounds. Id. at 941, 153 USPQ at 52. Nor did the applicants' affidavit help their case: "the sum and substance of the affidavit appear[ed] to be that one of ordinary skill in the art would know 'how to use' the compounds to find out in the first instance whether the compounds are—or are not—in fact useful or possess useful properties, and to ascertain what those properties are." Id. at 942, 153 USPQ at 53.

The Kirk court held that an earlier CCPA decision, holding that a chemical compound meets the requirements of § 101 if it is useful to chemists doing research on steroids, had effectively been overruled by Brenner. "There can be no doubt that the insubstantial, superficial nature of vague, general disclosures or arguments of 'useful in research' or 'useful as building blocks of value to the researcher' was recognized, and clearly rejected, by the Supreme Court" in Brenner. See Kirk, 376 F.2d at 945, 153 USPQ at 55.

More recently, in In re Ziegler, 992 F.2d 1197, 26 USPQ2d 1600 (Fed. Cir. 1993), the Federal Circuit considered the degree of specificity required to show utility for a claim to polypropylene. The U.S. application on appeal in Ziegler claimed priority to a German application filed in 1954. "In the German

application, Ziegler disclosed only that solid granules of polypropylene could be pressed into a flexible film with a characteristic infrared spectrum and that the polypropylene was 'plastic-like.'" Id. at 1203, 26 USPQ2d at 1605. "Ziegler did not assert any practical use for the polypropylene or its film, and Ziegler did not disclose any characteristics of the polypropylene or its film that demonstrated its utility." Id. The court held that the German application did not satisfy the requirements of § 101 and therefore could not be relied on to overcome a rejection based on an intervening reference. See id., 26 USPQ2d at 1606. "[At] best, Ziegler was on the way to discovering a practical utility for polypropylene at the time of the filing of the German application; but in that application Ziegler had not yet gotten there." Id., 26 USPQ2d at 1605.

On the other hand, the CCPA reversed a rejection for lack of utility in In re Jolles, 628 F.2d 1322, 206 USPQ 885 (CCPA 1980). The applicant in Jolles claimed pharmaceutical compositions that were disclosed to be useful in treating acute myeloblastic leukemia. See id. at 1323, 206 USPQ at 886. The active ingredients in the compositions were closely related to daunorubicin and doxorubicin, both of which were "well recognized in the art as valuable for use in cancer chemotherapy." Id., 206 USPQ at 887. The applicant also submitted declaratory evidence showing that eight of the claimed compositions were effective in treating tumors in a mouse model, and one was effective in treating humans. See id. at 1323-24, 206 USPQ at 887-88. The court noted that the data derived from the mouse model were "relevant to the treatment of humans and [were] not to be disregarded," id. at 1327, 206 USPQ at 890, and held that

the evidence was sufficient to support the asserted therapeutic utility. See id. at 1327-28, 206 USPQ at 891.

The Federal Circuit held in Cross v. Iizuka, 753 F.2d 1040, 224 USPQ 739 (Fed. Cir. 1985), that in vivo testing (as in Jolles) was not necessarily required to show utility in the pharmaceutical context. The Cross court stated that "[it] is axiomatic that an invention cannot be considered 'useful,' in the sense that a patent can be granted on it, unless substantial or practical utility for the invention has been discovered and disclosed where such utility would not be obvious." Id. at 1044, 224 USPQ at 742 (citing Brenner v. Manson). The court "perceive[d] no insurmountable difficulty, under appropriate circumstances, in finding that the first link in the screening chain, in vitro testing, may establish a practical utility for the compound in question." Id. at 1051, 224 USPQ at 748. Successful in vitro testing could provide an immediate benefit to the public, by "marshal[ling] resources and direct[ing] the expenditure of effort to further in vivo testing of the most potent compounds . . ., analogous to the benefit provided by the showing of an in vivo utility." Id. On the facts of that case – successful in vitro testing supplemented by similar in vitro and in vivo activities of structurally similar compounds – the court held that in vitro activity was sufficient to meet the requirements of § 101. See id.

The Federal Circuit confirmed in In re Brana, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995), that human testing is not necessary to establish utility for a method of treatment. The invention claimed in Brana was a group of compounds disclosed to have antitumor activity. See id. at 1562, 34 USPQ2d at

1437-38. The specification disclosed that the claimed compounds had higher antitumor activity than related compounds known to have antitumor activity, and the applicants provided declaratory evidence of in vivo activity against tumors in a mouse model. See id., 34 USPQ2d at 1438. The court held that these data were sufficient to satisfy § 101; usefulness in patent law does not require that the invention be ready to be administered to humans. See id. at 1567, 34 USPQ2d at 1442.

Several lessons can be drawn from Brenner and its progeny. First, § 101's requirement that an invention be "useful" is not to be given its broadest reach, such that little or nothing of a chemical nature would be found to lack utility. See Brenner, 383 U.S. at 530, 148 USPQ at 694. Thus, not every "use" that can be asserted will be sufficient to satisfy § 101. For example, the steroid compound at issue in Brenner was useful as a possible object of scientific inquiry, and the polypropylene claimed in Ziegler was useful for pressing into a flexible film, yet both lacked sufficient utility to satisfy § 101. See Brenner, 383 U.S. at 529, 148 USPQ at 696; Ziegler, 992 F.2d at 1203, 26 USPQ2d at 1605.

Rather than setting a de minimis standard, § 101 requires a utility that is "substantial", i.e., one that provides a specific benefit in currently available form. Brenner, 383 U.S. at 534-35, 148 USPQ at 695. This standard has been found to be met by pharmaceutical compositions shown to be useful in mouse models and in humans for treating acute myeloblastic leukemia (Jolles, 628 F.2d at 1327-28, 206 USPQ at 891); by evidence showing successful in vitro testing supplemented by similar in vitro and in vivo activities of structurally similar

compounds (Cross, 753 F.2d at 1051, 224 USPQ at 748); and by evidence showing in vivo antitumor activity in mice, combined with a disclosure that the claimed compounds had higher antitumor activity than a related compound known to have antitumor activity (Brana, 51 F.3d at 1567, 34 USPQ2d at 1442).

By contrast, Brenner's standard has been interpreted to mean that "vague, general disclosures or arguments of 'useful in research' or 'useful as building blocks of value to the researcher'" would not satisfy § 101. See Kirk, 376 F.2d at 945, 153 USPQ at 55 (interpreting Brenner). Likewise, a disclosure of a "plastic-like" polypropylene capable of being pressed into a flexible film was held to show that the applicant was "at best . . . on the way to discovering a practical utility for polypropylene at the time of the filing," but not yet there. Ziegler, 992 F.2d at 1203, 26 USPQ2d at 1605.

On this record, the examiner finds (Answer, page 3), the FGF-CX polypeptide comprising an amino acid sequence shown in SEQ ID NO:2[3] "is what is termed an 'orphan receptor' in the art. This is a protein whose cDNA has been isolated because of its similarity to known proteins." According to the examiner (Answer, page 5), "[t]he instant claims are drawn to a protein of as yet undetermined function or biological significance." While the examiner recognizes (Answer, page 6), "[t]he instant specification refers to 'FGF-CX-like activities and physiological functions," the examiner finds (id.), the specification

[3] See specification, page 2, wherein appellants disclose "an example of an FGF-CX polypeptide is a polypeptide including the amino acid sequence of SEQ ID NO:2."

"fails to describe what these activities or functions are." For the reasons set forth below, we are not persuaded by the examiner's assertions.

I. Structural Similarity and Biological Activity:

The examiner recognizes (id.), the claimed polypeptide "is known to share some structural similarity to the FGF family of proteins which are known in the art to have biological significance in regulation of cell proliferation, differentiation, and function based on sequence similarity to members of the FGF-family." In addition, the examiner recognizes (Answer, page 7), the polypeptide of claim 1 shares approximately 70% amino acid sequence similarity/identity with the most closely related protein of the prior art. Nevertheless, with reference to Galzie, the examiner finds (Answer, page 6), "the FGF family is complex and diverse...", and is comprised of members "wherein none of the associated functions are found in common with any other family member." Therefore, the examiner concludes (Answer, page 7), "one could not predict which biological activity is possessed by the disclosed protein based on structural similarity alone, especially since all the members share structural similarity, but not functional similarity."

Based on the foregoing, the examiner does not dispute that the claimed polypeptide is structurally similarity to the FGF-family of proteins. Thus, the question is whether the claimed polypeptide has a biological activity that is consistent with the activity predicted for it based on its structural similarity to the FGF-family of proteins. In this regard, appellants explain (Brief, page 7), the expressly stated purpose "of [e]xample 10 [(specification, page 103)] was '[t]o

determine if recombinant FGF-CX induces cell proliferation...', and '[i]t was found that FGF-CX induces about a 3-fold increase in cell number relative to control protein in this assay (Fig. 17).'" As appellants point out (id.), "[e]xample 10 concludes with the statement: '[t]hese results show that FGF-CX acts as a growth factor and suggest that recombinant FGF-CX mediates the morphological transformation of NIH 3T3 cells.'"[4] According to appellants (Brief, page 9), "the claimed FGF-CX polypeptide has a biological activity similar to a structurally related fibroblast growth factor-9 (FGF-9) compound already known and tested in the art for activation/proliferation of glial cells and fibroblasts (see pages 76 and 77 of the specification as filed along with FIGS. 4 and 5)."

Thus, not only do appellants demonstrate that the claimed polypeptide is structurally similar to FGF-family proteins, appellants also provide data demonstrating that this polypeptide stimulates cell growth and proliferation, which is consistent with the biological activity of the FGF-family proteins. Accordingly, we are not persuaded by the examiner's assertion that the specification fails to set forth a biological activity for the claimed polypeptide.

[4] We recognize the examiner's assertion (Answer, page 9), that "NIH 3T3 cells are a designated cell line which originated from fibroblast cells, however, they are cells which are no longer in their native environment and do not necessarily behave as a natural fibroblast cell would. [Therefore,] the fact that the claimed protein of the instant invention transforms these cells as well as stimulates proliferation of these cells does not support the asserted uses of the claimed protein as disclosed in the instant specification." The examiner, however, provides no evidence to support her assertion, nor does the examiner provide evidence that NIH 3T3 cells are not recognized in the art for use in cell proliferation assays like those set forth in appellants' specification.

II. Expression:

The examiner recognizes (Answer, page 7), appellants' specification provides "data on expression of the claimed protein, indicating that it is expressed in normal cerebellum, as well as in several human tumor cell lines without being expressed in corresponding normal tissues"; "a chromosomal location for the FGF-CX"; and that "'[e]xpression of heterologous FGF-CX in NIH 3T3 cells is found to induce their transformation and tumorigenicity....' [alteration original]." Nevertheless, the examiner concludes (Answer, bridging sentence, pages 7-8) that "[e]xpression of the claimed polypeptide in cancer tissue does not establish a nexus between the claimed protein and cancer growth." Further while the examiner recognizes (Answer, page 8, alteration original) that appellants' specification discloses, at page 101, "'[s]pecific disease indications where therapeutic targeting of FGF-CX might be applied include adenocarcinomas of the colon, prostate, lung, kidney, uterus, breast, bladder, ovary' (see lines 26-28)", the examiner finds (id.), "in the absence of a nexus or correlation with a particular disease or cancer, the instant specification does not disclose a substantial 'real world' use for the claimed invention...."

In response, appellants argue (Brief, page 6), the claimed polypeptide, "may be used to stimulate cell growth, including especially growth of fibroblasts and epithelial cells in the linings of the gastrointestinal tract." See e.g., Specification, page 5. In addition, appellants' specification discloses (page 76), "FGF-CX can also be used to stimulates [sic] fibroblasts (for accelerating healing of burns, wounds, ulcers, etc.)...." In response, the examiner asserts (Answer,

page 11), "[t]he fact that the specification ... includes a recitation that the claimed invention may ... stimulate cells of the gastrointestinal tract in addition to [the disclosure of] all of the other possible uses of the claimed invention does not appear to provide a substantial utility for the claimed invention as filed." According to the examiner (Answer, page 12), "the skilled artisan would need to carry out further research on the claimed invention to determine which of the possible asserted uses the claimed invention could be used for; this does not constitute a disclosure of a substantial utility." We are not persuaded by the examiner's assertion.

As appellants point out (Brief, page 8), "[t]he fact that multiple utilities are recited in the specification does not mean that there is a lack of a specific, substantial and credible utility." We agree. As appellants point out (id.), in In re Gottlieb, 328 F.2d 1016, 1018, 140 USPQ 665, 667-668 (CCPA 1964), "multiple utilities were disclosed. The Court held that one specific utility was sufficient to meet the utility requirement...." On this record, the examiner failed to provide sufficient evidence to suggest that the claimed invention would not be useful for stimulating cell growth, including growth of fibroblasts and epithelial cells in the linings of the gastrointestinal tract. See e.g., Specification, page 5. Accordingly, we are not persuaded by the examiner's assertion that the claimed invention lacks a patentable utility.

On reflection, it is our opinion that the examiner failed to meet her burden of providing the evidence necessary to sustain a rejection for lack of utility. Accordingly, we reverse the rejection of claims 1, 5, 41, 46, 63 and 64 under 35

U.S.C. § 101 as lacking utility and § 112, first paragraph, for lack of enablement based on the finding of lack of utility.

REVERSED

William F. Smith
Administrative Patent Judge

Donald E. Adams
Administrative Patent Judge

Eric Grimes
Administrative Patent Judge

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